CHAPTER VI—AGRICULTURE, CO-OPERATION AND FORESTS.

(i) Weather and Crops.

578. The distribution of rainfall by districts according to seasonwar is as follows :—

Districts	South-west Monsoon		North-west Monsoon		Totals	
	April 1951 to Sept. 1951	Average	Oct. 1951 to March 1952	Average	April 1951 to March 1952	Average
	Inches	Inches	Inches	Inches	Inches	Inches
Bangalore ...	24.2	21·9	6·0	9·1	30·2	31·0
Kolar ...	18·3	19·3	5·0	9·0	23·3	28·2
Tumkur ...	19·4	18·3	8·2	7·8	22·6	26·1
Mysore ...	20·6	19·4	7·1	9·7	27·7	29·0
Mandya ...	26·7	18·5	7·5	9·8	34·2	28·3
Hassan ...	32·8	28·7	4·2	10·0	37·0	38·7
Shimoga ...	48·8	49·4	6·0	7·6	54·8	57·0
Chikmagalur ...	67·4	63·2	7·4	10·3	74·8	73·5
Chitaldrug ...	17·3	15·4	4·7	6·6	22·0	22·0
State Total ...	29·2	27·1	5·7	8·8	34·9	35·9

579. The largest total rainfall for the year (from 1st July 1951 to 30th June 1952) was 387·86 inches at Agumbe in the Shimoga District. The smallest total for the year was 4·0 inches gauged at Sarjapur in the Bangalore District. The heaviest fall in 24 hours for the year was at Agumbe in the Shimoga District where a rainfall of 18·92 inches was recorded on the 23rd July 1951.

(ii) Agriculture.

580. The Agricultural season for 1951-52 was generally very poor throughout the State and particularly in the low rain fall districts of Kolar, Tumkur and Chitaldrug. Distress conditions began to be noticed in all the districts

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at the end of the year as a consequence of the poor monsoons in 1951. Except for Shimoga, the seasonal conditions were below normal in all the districts. Early rains in many regions were no doubt favourable but in all the districts, a long drought followed sowings. The crops were not generally in a condition to derive the benefit by the good rains that were received in the later half of the monsoon.

581. In Bangalore, the rain was less than normal. In areas where early rains were received, the crops were sown in season but on account of a long drought which prevailed in August, the sowings were affected. Although the yields were generally poorer than those of the previous year, they turned out to be not so bad as was expected in August.

582. In Chikmagalur, the season commenced brightly with good early rain for adequate preparation of land in July but droughty conditions followed and the rains in the later part of the monsoon were not distributed evenly enough for a normal crop.

583. In Chitaldrug, the early part of the monsoon was erratic and the *Mungar* (early season) crops were very unsatisfactory. The *Hingar* (late season) crop were more favourable. Molkalmuru recorded a rainfall of only 16·41 inches and this low rainfall affected crop yields to a very great extent.

584. *Hassan.*—Hassan had less than an average rainfall, and this affected the dry land crops.

585. *Kolar.*—Kolar had a very poor agricultural season. The rainfall was both inadequate and uneven, the eastern taluks receiving very poor rain. Generally, the pre-monsoonal showers were adequate for preparatory cultivation and timely sowings but as in many districts, the sowings were followed by a long drought, more prolonged than elsewhere and extending to nearly two months. The grain filling rains in late September were heavy but by then, the crops had suffered so badly that they could not benefit from the rains. The dry land crops were thoroughly disappointing.

586. *Mandya.*—In Mandya the rains commenced early, but failed in August following the sowings. The dry

land crops were below average but this was offset by a full reservoir at the head works of the Visvesvaraya Canal system and adequate supply of irrigation water for paddy and sugarcane and in some areas irrigated ragi.

587. *Mysore.*—Mysore District had a poor season. The early rains were inadequate and followed by an indifferent monsoon. Both the *Mungar* and the *Hingar* crops were less than the average.

588. *Shimoga.*—Shimoga fared a little better than all the other districts. The early showers were timely but post-sowing rains were meagre. Later rains were both timely and adequate and a fairly good crop of paddy was harvested. Groundnut on account of a poor sequence of rains, fared very badly.

589. *Tumkur.*—Tumkur also suffered on account of a poor agricultural season and the low rainfall taluks fared more badly resulting in distressing conditions with regard to water and fodder. Except under tanks and wells, the crop yields were generally very poor.

Agricultural prices.

590. As in the previous year, the foodgrain prices continued to be controlled and there was therefore no change. But in respect of other commodities, the prices continued to move upwards till February. From that period onwards, there was general recession of prices in the wholesale markets. By the end of the year, there was a slumpish inactivity in the grain and commodity markets. The fairly steep fall in prices, however, did not affect the retail market to any appreciable extent.

591. *Pulses.*—The prices of pulses fluctuated widely, varying from Rs. 50 to Rs. 65 and Rs. 40 to Rs. 50 per palla in the latter part of the year. Horsegram varied from Rs. 38 to Rs. 48 per palla. Bengalgram was controlled and locally it was sold at varying rates.

592. *Oilseeds.*—Gingelly was quoted at a price of Rs. 225 per 225 seers and the average showed round about Rs. 180 per 255 seers. Groundnut also was quoted at varying rates. Castor seed varied from Rs. 60 to Rs. 80 per unit of 165 lbs. and cotton seed was also sold at a varying price of Rs. 3 to Rs. 5 per unit of 25 lbs. in Bangalore Market.

593. *Sugar.*—Sugar was being sold at controlled rates.

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594. *Potatoes.*—Potatoes were sold at prices varying from Rs. 150 to Rs. 200 per unit of 31 maunds and a sudden rise of Rs. 210 to Rs. 230 during the months of June and July 1951. During the harvest season in September and October 1951, there was a sharp decline, the price varying from Rs. 80 to Rs. 100 in the case of stock produced in Hassan Area.

595. *Cocoanut.*—The prices of cocoanuts varied from Rs. 215 to Rs. 310 per 1,000 nuts and retail price varied from 4 to 3 a rupee. The price of copra varied from Rs. 27 to Rs. 31 per maund of 25 lbs. At the end of the year, the price declined to about Rs. 100 per 1,000 cocoanuts.

596. *Cardamom.*—Varied from Rs. 350 to Rs. 400 per maund.

597. *Pepper.*—The rate of pepper was varying from Rs. 120 to Rs. 140 per maund of 25 lbs. and Rs. 145 to Rs. 150 in the latter part of the year.

598. In Chikmagalur, the prices of oil seeds were low at the end of the year. Cotton also showed a downward tendency throughout the year in this district.

599. In Mysore, the prices were steady, but after the recession, the prices fell very steeply in all the groups and particularly in oil seeds.

600. In Shimoga market, which is the centre for arecanut, the prices which were ruling at about Rs. 50 for a long time dropped down to nearly Rs. 28, but there was a slight improvement later in the season.

Agricultural Education.

601. There were, as in the previous year, six departmental institutions imparting agricultural education.—4 at the pre-secondary, 1 at the post-secondary and 1 at collegiate level. The post-secondary Agricultural School imparting education in English and the Agricultural College, both at Hebbal continued to be outside the jurisdiction of the Agricultural Department.

602. There were 4 kannada agricultural schools at Chikkanahalli, Anekal, Somanahalli and Garudapalya. The response from the agricultural classes was very poor. As usual, S.K.V.D. Patasala attracted the largest number of pupils.

Plant Improvement

603. The Plant Breeding programme as in the previous year related to improvement of paddy, ragi, jowar,

cotton, groundnut, sugarcane, small millets like *haraka*, *navane*, *same*, etc.

604. *Paddy.*—The main items of work related to yield trials of Bangar kovi hybrids (S.705--Bangar kaddi X S. 661 —Coimbatore sanna); (2) six Kempa kovi hybrids (S. 67—Kembuthi (X S. 701—Coimbatore sanna); (3) eight Gavokovi hybrids (C.S. 199 Alur sanna X S. 661 Coimbatore sanna); (4) ten varieties of *kar* paddy (summer paddy),; (5) three punaji selections (rainfed paddy) (*b*) plant selection, (*c*) maintenance of type collections, (*d*) cultural trials, (*e*) manurial, plant pathological and entomological investigations.

605. These trials were conducted principally at the Paddy Breeding Station. A few selections were tried at Central Farm, Hebbal and Anandapurm Farm.

606. Among Kar paddy selections, H. 328 gave an yield of 3,050 lbs. per acre. Punagi selections under irrigated conditions proved no match to the standard varieties like Ratnachudi and Coimbatore sanna.

607. One hundred individual plant selections were made during the year. A few first generation Indo-Japonica crosses were under observation. New crosses were effected between S. 199 a fine irrigated paddy and Anklo 6—a Baroda strain suitable and getting popular as a rainfed paddy—the idea being to obtain a high yielding finer paddy than Anklo for rainfed paddy zones. New varieties and selections were obtained from districts as well as from Madras and Assam to add to the collections which already exceed 400 in number. Russian, Chinese and Ceylon varieties which were introduced some years ago were under observation for yield, suitability, etc.

608. *Ragi.*—The work on ragi during the year comprised of trials of (*a*) 4 varieties of *kar* ragi (early ragi selections), (*b*) 12 irrigation ragi selections, (*c*) nine hybrids, and (*d*) standard varieties in addition to maintenance and observation of type collections.

609. Among the *kar* ragis, E.S. 11 continued to be promising both for grain and straw yields. Among the standard varieties, R. 0870—a *hain* or late season ragi with violet closed spikes has given uniformly better yields during the past five years.

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610. As part of an All-India trial of hybrid maize from U.S.A. under the auspices of the Indian Council of Agricultural Research, preliminary field experiments were undertaken at Visvesvaraya Canal Farm.

Cotton.

611. *Upland Cottons.*—A comparative yield trial of 7 varieties of Mysore American cottons with Co. 4 from the neighbouring State of Madras showed that M. A. V. with a staple of 28 mm and ginning percentage of 35 per cent gave 1,241 lbs. per acre against 1,193 lbs. from Co. 4 with a staple of 27 mm and 35 per cent ginning outturn.

612. Among other lines that were being pursued for the improvement of cotton either by breeding new strains or introduction from other cotton stations were (1) studies of interspecific hybrids from Surat, (2) trial of Greek cottons, (3) trial of "Lakshmi" a fine cotton strain from Bombay, etc. Twenty selections were made among the interspecific hybrids. The Greek cottons, besides being low yielders compared to M.A.V. developed leaf diseases.

613. *Egyptian cotton.*—The best sowing months for Egyptian cotton were found to be October and November at V. C. Farm and May and June at Babbur Farm. Giza 7 and 12 had given higher yields than others and those were as good as M.A.V. yield, *viz.*, about 700 lbs. per acre.

614. *Medium staple cotton.*—A large percentage of cotton areas in Mysore State was sown to short and medium staple cottons although under the Cotton Expansion Scheme launched two years ago, the area under long staple was rapidly increasing. A fine medium staple cotton Selection 69 was evolved over two decades ago and it rapidly replaced short staples. But for various reasons and the introduction of good varieties from the neighbouring districts of Bombay, this variety was rapidly losing favour with the cultivators.

615. *Groundnuts.*—The scheme subsidised by the Indian Central Oil Seeds Committee was in its eighth and final year. Among the spreading types G. 0789 and G. 0127 had proved promising. In the Bunch early group G. 0553 and G. 1005 gave better results than either Spanish or TMU. 2.

Cocoanuts.

616. *Cocoanuts.*—The Cocoanut Nursery Scheme which was subsidised by the Indian Central Cocoanut Committee and which was till stationed at Arsikere, was transferred

to Hebbal at the end of the year. Of the 4,100 nuts planted in the previous year, nearly 70 per cent grew into quality seedlings and all of them were distributed. A scheme for the establishment of a Cocoanut Research Station in the State under the auspices of the Central Committee was under examination.

Sugarcane.

617. The Mysore Department of Agriculture had been in the forefront of sugarcane breeding for over three decades. Situated as it is in the sub-tropics the emphasis had all along been on the breeding of the thick canes for various soils and crop zones of the State. In addition to selection, hybridisation, etc., special methods like irradiation of buds to induce variation had been developed. The department had evolved a good number of varieties and one of them H.M. 320 was the mainstay of the large Sugar Factory at Mandya started about 20 years ago.

618. Out of about 43,500 acres of sugarcane in the State during the year, about 77 per cent were planted to improved varieties. In Mandya District, the predominant type is a factory cane like Co. 419, while in gur acres, H. M. 320 pattapatti, cheni and also Co. 419 were preferred.

619. Jaggery yield trials have revealed that all the early Mysore canes H.M. 320, 647, 661 and Coimbatore canes like Co. 417, 419, 423, 631 and 636 as also the I.C. canes numbering 82,634,201, etc., were suitable for jaggery.

Crop Improvement.

620. The main investigations in the division of agricultural chemistry related to the efficient use of phosphatic fertilisers for ragi, paddy, sugarcane and groundnut, the effect of increasing the doses of nitrogen and phosphorous on the yield of ragi and paddy, the influence of calcium and phosphorous on the yield and pod filling of groundnut and on the yield of paddy use of new fertilisers like liquid ammonia, and ammonium nitrate and the influence of trace elements like zinc, boron and copper on ragi and paddy yields. Other items of work which were initiated in the previous years like economic manuring of potatoes, optimum time of application of ammonium sulphate for paddy, associated growth of legumes and cereals (*akkadi*) etc., were continued. More than 25 surface and sub-surface soil samples from different parts of the State were collected for determining their baron and manganese contents as part

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of a rough survey of micro nutrient status of the principal soil groups of the State.

621. Field trials for determining optimum depth for placement of phosphates of ragi and sugarcane were continued and extended to another crop—groundnut. While application of super had increased the yield of groundnut significantly, the response to different placements was insignificant as was to be expected from a legume like groundnut which could utilise phosphorous whether placed on the surface or 3 inches deep.

622. Experiments to study the effect of increasing nitrogen and phosphorous applications on the yield and composition of paddy were continued. A study of percentage increase both of grain and straw, the weight per earhead and the ratio of straw to grain as a result of doubling and trebling the manurial dosage, confirms the previous finding that phosphorous had a positive influence on grain formation and that its application at a proper period, *i.e.*, at planting and without increasing the dosage, better yields may be secured.

623. Groundnut is an important cash crop in the State and there was a good crop mainly in the district of Chitaldrug. Since it is a legume and considered as a " Self Fertilising " crop, the importance of adequate and balanced fertilisation was not well realised.

624. Trials conducted in the previous years to test the effect of calcium and phosphates on paddy were continued at the Paddy Breeding Stations, but the results were found insignificant except that for a slightly higher lime content in grains which came from the treated plants.

Soil Survey.

625. From October 1947 to December 1951, 238 villages with an area of 2·29 lakhs acres were surveyed under the Davangere Branch Channel, both in respect of existing and potential crop possibilities and suitability of areas for irrigation. An extent of 1·36 lakhs acres had been tentatively selected as suitable for irrigation by the Davangere Branch Channel from the Lakkavalli Reservoir.

Seed Multiplication and Distribution.

626. Twenty-five thousand six hundred pallas of paddy, 2,500 pallas of ragi and an equal quantity of jowar were procured for distribution. Nine hundred and thirty-two plots covering 2,400 acres were subsidised for seed

production and 24,000 pallas of seed paddy grown in the holdings under departmental supervision were procured by the Department by payment of a premium of 10 per cent over the market rate.

Entomological Investigations.

627. One of the most important items of work of the Division of Entomology of the Department related to the discovery for the first time in India, of the famous beneficial predator, *Cryptolæmus montrauzieri* Muls on mealy bugs which saved the citrus industry of California when introduced into that State from Australia in 1892. This beetle was noted in July 1951, swarming in late larval and pupal stages on mealy bugs infesting the ornamental plant Aracharia and later on the mealy bugs on guava and mango. The life history and host range of this beetle was studied in some detail. This discovery had aroused interest among citrus and coffee growers for controlling, pseudococcus and phenococcus species of mealy bugs on citrus and coffee and an initial supply of 500 larvæ and adults was made to an orchard in Tinnevelly District.

628. Another predator which was brought under study was a dark shining bug Geocoris tricolor Fabr. feeding on mealy bugs of cotton, citrus, guava, mango, etc. Experimental testing showed that these predators feed very actively on cotton aphids the red mite, *Tetranychus telarius* Linnae also.

629. The work on beneficial predators on crop pests which was taken up intensively only an year ago has already yielded important indications of great practical value in plant protection.

The biological studies relating to paddy grasshopper which were initiated in the previous years were continued.

630. Fundamental studies on the occurrence and incidence of several beneficial predators belonging to the family coccinallidæ chiefly, were taken up. These predators held out considerable promise for the control of several pernicious pests like-mealy bugs, scale insects, aphids, etc., infesting orchards, ornamental and food crops.

631. *Synonycha grandis* Thumb—an important natural enemy of the sugarcane aphid in some eastern countries was found in Bangalore on bamboo infested with wooly

aphis. Although wooly aphis is the natural host in nature, in the laboratory it was found on a number of species of aphids on groundnut, cotton, cowpea, lucerne, vegetables and orchards plants.

632. Tamarind seed is receiving increasing attention as a sizing material. Both on account of its wide application in industry and its use as a hog feed and in some areas, under scarcity conditions, as human food, a beginning was made to study the biology of the tamarind seed borer—*Sitophilus linearis* Herbst an indigenous weavil which causes great damage to tamarind seeds in store every year. By the time the larva of the borer completes its development little will be left of the tamarind seed except the seed coat and a mass of powder. Information of this borer was rather meagre and a detailed study of the insect had been taken up.

Agricultural College School and the Central Farm, Hebbal, Bangalore.

633. The strength of the College was 94. Most of the members of the teaching staff in the College were officers of the Agriculturl Department. They were part-time Lecturers in the College.

634. The collections of the Agricultural College Herbarium which was started last year includes plants collected by students and staff in the surroundings of Bangalore as well as other places.

635. The Botanic Garden which was started recently has a collection of important fruit trees and economic and medicinal plants. An apiary is attached to the garden.

636. The Central Farm is intended for practical training of the students of the Agricultural College and the school in field operations and for providing facilities to research sections for carrying on their field experiments.

Cotton Expansion.

637. Action was taken to step up cotton production by (1) increasing cotton acreage to at least the level at which it stood between 1911-1920, *viz.*, 1·25 lakhs acres, (2) evolution of suitable medium and long staple cottons with higher yield, longer staple, higher ginning outturn and fibre strength and resistance to disease; (3) increasing the area under long staple upland cottons in both cotton and other regions, (4) introducing long staple cotton to other districts where the prevalent soil is red, (5) encouraging